

Name: \_\_\_\_\_

## at1119paper: Complete the Square, $b = \text{odd}$ (v519)

### Example

By completing the square, find both solutions to the given equation:

$$x^2 - 35x = -264$$

Add  $\left(\frac{-35}{2}\right)^2$ , which equals  $\frac{1225}{4}$ , to both sides of the equation.

$$x^2 - 35x + \frac{1225}{4} = \frac{169}{4}$$

Factor the left side.

$$\left(x + \frac{-35}{2}\right)^2 = \frac{169}{4}$$

Undo the squaring.

$$\begin{array}{lll} x + \frac{-35}{2} = \frac{-13}{2} & \text{or} & x + \frac{-35}{2} = \frac{13}{2} \\ x = \frac{35 - 13}{2} & \text{or} & x = \frac{35 + 13}{2} \\ x = 11 & \text{or} & x = 24 \end{array}$$

### Question 1

By completing the square, find both solutions to the given equation:

$$x^2 + 23x = 78$$

$$x^2 + 23x + \frac{529}{4} = \frac{841}{4}$$

$$\left(x + \frac{23}{2}\right)^2 = \frac{841}{4}$$

$$\begin{array}{lll} x + \frac{23}{2} = \frac{-29}{2} & \text{or} & x + \frac{23}{2} = \frac{29}{2} \\ x = \frac{-23 - 29}{2} & \text{or} & x = \frac{-23 + 29}{2} \\ x = -26 & \text{or} & x = 3 \end{array}$$

## Question 2

By completing the square, find both solutions to the given equation:

$$x^2 - 25x = 1034$$

$$x^2 - 25x + \frac{625}{4} = \frac{4761}{4}$$

$$\left(x + \frac{-25}{2}\right)^2 = \frac{4761}{4}$$

$$x + \frac{-25}{2} = \frac{-69}{2}$$

$$x = \frac{25 - 69}{2}$$

$$x = -22$$

or

$$x + \frac{-25}{2} = \frac{69}{2}$$

$$x = \frac{25 + 69}{2}$$

$$x = 47$$

or

or

## Question 3

By completing the square, find both solutions to the given equation:

$$x^2 + 5x = 66$$

$$x^2 + 5x + \frac{25}{4} = \frac{289}{4}$$

$$\left(x + \frac{5}{2}\right)^2 = \frac{289}{4}$$

$$x + \frac{5}{2} = \frac{-17}{2}$$

$$x = \frac{-5 - 17}{2}$$

$$x = -11$$

or

$$x + \frac{5}{2} = \frac{17}{2}$$

$$x = \frac{-5 + 17}{2}$$

$$x = 6$$

or

or